

1. A method of manufacture of a refiner filling having blades and spacers comprising the steps of:

establishing the defining margins of an active refining zone of the refiner;

5 selecting a pumping angle of the refiner filling;

subdividing the filling into equal segments with each segment having spaced edges extending between the defining margins, and with one segment edge lying along a pumping angle;

10 subdividing the segments into bar set clusters with each cluster having an edge defining a pumping angle;

combining the outline of two clusters to form a bar set envelope;

assembling blades and spacers in the bar set envelope;

severing the bar set into two equal bar set clusters;

assembling clusters to form a refiner segment; and

15 assembling segments to form a refiner filling.

2. A method of manufacture of a refiner filling having blades and spacers comprising the steps of:

20 establishing the outer and inner perimeters of an active refining zone of the refiner;

selecting a pumping angle off-set from a radial of the refiner filling;

subdividing the filling into equal segments with each segment having spaced edges extending between inner and outer perimeters, and with one segment edge lying along a pumping angle off-set from a radial;

25 subdividing the segments into bar set clusters with each cluster having an edge defining a pumping angle;

combining the outline of two clusters to form a bar set envelope;

assembling blades and spacers in the bar set envelope;

severing the bar set into two equal bar set clusters;

30 assembling clusters to form a refiner segment; and

assembling segments to form a refiner filling.

3. A method according to claim 2 in which the refiner filling is a disc of 360° , the segments each having degree value as an integer 360° , and the pumping angle being evenly divisible into 360° , and into the degree value of the segments.

5 *Fig. 8* 4. A bar set preform for a refiner filling having a selected pumping angle, the preform comprising a perimeter outline defining a parallelogram, the side edges of the parallelogram offset by a value equal to the pumping angle, an array of blades and spacers arranged alternately to substantially fill the area of the parallelogram, the blades and spacers affixed to each other, and a cut line across 10 the parallelogram for dividing the bar set into two pieces with each piece having an edge corresponding to the pumping angle.

5. A bar set preform as defined in claim 4 in which the blades are prenotched along the cut line.

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6. A bar set preform as defined in claim 5 in which the inner end of each blade is tapered.

7. A refiner filling comprising an active refining zone of bars and 20 spacers fabricated by:

establishing the outer and inner perimeters of an active refining zone of the refiner;

selecting a pumping angle off-set from a radial of the refiner filling;

subdividing the filler into equal segments with each segment having 25 spaced edges extending between inner and outer perimeters, and with one segment edge lying along a pumping angle off-set;

subdividing the segments into bar set clusters with each cluster having an edge defining a pumping angle;

combining the outline of two clusters to form a bar set envelope;

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assembling blades and spacers in the bar set envelope;

severing the bar set into two equal bar set clusters;

assembling clusters into a refiner segment; and

assembling segments into a refiner filing.

8. A bar set cluster for a refiner filling having a radius, outer and inner perimeters and a selected pumping angle, the cluster margins being defined by 5 spaced side edges lying along the pumping angle, an outer margin defined by a chord of the outer perimeter between spaced side edges, and an inner margin defined by a line parallel to the chord and intersecting both the inner perimeter and one side edge, and an array of blades and spacers occupying substantially the entire area defined by the cluster margins, and each blade lying along the pumping 10 angle.

9. A refiner filling comprising blades and spacers, at least one of a first blade of predetermined length having a tapered end, at least one of a second blade having said predetermined length and having a notch through which the blade is cut 15 into blade segments, said notch being defined by tapered shoulders so that each blade segment has a tapered end, and a spacer placed between adjacent blades defining a groove between the blades.

10. A refiner filling comprising blades and spacers, at least one of a 20 first blade of predetermined length having a tapered end, at least one of a second blade having said predetermined length and having an end notch defined by a tapered shoulder through which end notch the blade is cut, at least one of a third blade having said predetermined length and having a center notch through which the blade is cut into blade segments, said end and center notches being defined by 25 tapered shoulders so that each blade segment has a tapered end, and a spacer placed between adjacent blades defining a groove between the blades.